TRANSLATION PATENT COOPERATION TREATY POT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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International application No.				International filing da	ate (day/month/year)	Priority date (day/month/year)
PCT/EP2004/012297			297	29.10.200	4	31.10.2003
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LU8	G03/	76, BUI	J19/24,	, B01J19/18	•	
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1.				minary examination re e applicant according t		International Preliminary Examining Authority
2.		EPORT consists		-	sheets, including	g this cover sheet.
3.	This re	eport is also acco	ompanied by A	NNEXES, comprising:		
	a. 🔀	(sent to the	applicant and	to the International Bi	ureau) a total of	sheets, as follows:
						mended and are the basis for this report and/or
			s containing reductions).	ctifications authorized	by this Authority (see Ru	le 70.16 and Section 607 of the Administrative
						siders contain an amendment that goes beyond
		the d Box.	isclosure in the	e international applicat	tion as filed, as indicated	in item 4 of Box No. I and the Supplemental
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	, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see					
				readable form only, a rative Instructions).	is indicated in the Supple	mental Box Relating to Sequence Listing (see
4.						
	\boxtimes	Box No. I	Basis of the	report		
		Box No. II	Priority			
		Box No. III	Non-establi	shment of opinion with	regard to novelty, invent	ive step and industrial applicability
		Box No. IV	Lack of unit	ty of invention		
	\boxtimes	Box No. V		atement under Article d explanations support		lty, inventive step or industrial applicability;
		Box No. VI	Certain doc	uments cited		
		Box No. VII	Certain defe	ects in the international	application	
	\boxtimes	Box No. VIII	Certain obs	ervations on the interna	ational application	
Date of submission of the demand				Date of completion of the	is report	
Name and mailing address of the IPEA/EP					Authorized officer	
F 1 11 37					m.l. 1. 2.	
Facsimil	e No.				Telephone No.	

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/012297

Box	No. I	[Basis of the report		
1.		_	to the language, this report is based on the internation der this item.	nal application in the language in	which it was filed, unless otherwise
			eport is based on translations from the original langua is the language of a translation furnished for the purp		,
		\sqcup	international search (Rule 12.3 and 23.1(b))		
		\sqcup	publication of the international application (Rule 12.4))	
		Ш	international preliminary examination (Rule 55.2 and/	or 55.3)	
2.	With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):				
		the int	ternational application as originally filed/furnished		
	\boxtimes	the de	escription:		
		pages	1-27		as originally filed/furnished
		pages	*	received by this Authority on	
		pages	*	received by this Authority on	
	\boxtimes	the cla	aims:		
		nos.			as originally filed/furnished
		nos.*		as amended (togethe	er with any statement) under Article 19
		nos.*	1-31	received by this Authority on	22.08.2005 with telefax
		nos.*		received by this Authority on	
	\boxtimes	the dr	awings:		
		sheets	1/7-7/7		as originally filed/furnished
		sheets			
		sheets			
		a sequ	nence listing and/or any related table(s) – see Supplement		
3.		The a	mendments have resulted in the cancellation of:		
			the description, pages		
			the claims, nos.		
			the drawings, sheets/figs		
			the sequence listing (specify):		
			any table(s) related to sequence listing (specify):		
4.			report has been established as if (some of) the amend have been considered to go beyond the disclosure as fil		
			the description, pages		
			the claims, nos.		
			the drawings, sheets/figs		
			the sequence listing (specify):		
			any table(s) related to sequence listing (specify):		
*	If ite	ет 4 арј	plies, some or all of those sheets may be marked "supe	erseded."	

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/012297

Box			ticle 35(2) with regard to novelty, inventive step or industrial applicability; oporting such statement	
1.	Statement			
	Novelty (N)	Claims	1-31	YES
		Claims		NO
	Inventive step (IS)	Claims	1-31	YES
		Claims		NO
	Industrial applicability (IA)	Claims	1-31	YES
		Claims		NO

2. Citations and explanations (Rule 70.7)

This report makes reference to the following documents:

D1: DE 101 55 419 D2: US 4 289 895

Document D1 is regarded as the closest prior art and discloses (the references in parentheses are to that document):

a tower reactor comprising reaction zones for simultaneous esterification and/or transesterification, as well as pre-condensation, the individual reaction zones being interconnected and united in the tower reactor.

The subject matter of independent claim 1 differs from the above in that:

- the tower reactor is designed in its top third as a hydrocyclone (2) with an attached heat exchanger (5), and comprises a feed pipe (3) for the paste, slurry and/or liquid raw material mixture,
- the zone of the tower reactor below the

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

hydrocyclone (2) is designed in the form of a downdraft cascade (7);

- the cascade (7) communicates via a pipe with the lower part of the tower reactor, which is designed in the form of a single-stage or multiple-stage falling-film zone (9) with preexpansion (8).
- 2. The subject matter of claim 1 is thus novel (PCT Article 33(2)).

The present invention can therefore be considered to address the problem of simplifying a tower reactor.

- 3. The solution to this problem, as proposed in claim 1 of the present application, involves an inventive step (PCT Article 33(3)) for the following reasons. Document D1 does not describe the solution according to the application.

 Document D2 describes a device with three zones (40, 60a, 60b). Zone (40) is not integrated in the tower reactor. For this reason, pipes are required in the device to convey liquid from zone (40) to zone (60a). Document D2 thus neither describes nor suggests the solution according to the application.
- 4. Claims 2-30 are dependent on claim 1 and thus likewise meet the PCT novelty and inventive step requirements.

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
5.	Claim 31 is novel and inventive because the tower
	reactor to which it relates is novel and
	inventive.

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

- 6. As explained below, some of the features in the device claims 14, 18 and 21 relate to a process for using the device and not to the definition of the device in terms of its technical features. The intended restrictions are therefore unclear from the claim, which thus does not comply with PCT Article 6.
- 7. In claim 14, the features, "owing to the pressure loss in the slot, a constant filling level is generated above the pipes", "the slots are designed in such a way that viscosity variations do not cause any changes in filling level, but rather a change in filling level in relation to liquid throughput", are process features. They do not describe the device per se, but rather what happens when the device is used.
- 8. In claim 18, the feature, "a total wetting depending on product viscosity", is a process feature. It does not describe the device per se, but rather what happens when the device is used.
- 9. In claim 21, the feature, "with organic heating medium in vapour form", is a process feature. The feature, "with organic heating medium in vapour form", does not describe the device per se. It describes the device when the heating medium is conveyed through the pipe and heated until it is in vapour form.